

Canon



THE DIGITAL CAMCORDER FOR PROFESSIONALS

CANON XL1

Mini **DV**

The Canon DM-XL1

The professional choice

The Canon XL1 is one of the most innovative 3 CCD digital camcorders available. Not only does it feature a powerful high-resolution interchangeable 16x optical zoom with SuperRange Optical Image Stabilization, but also advanced digital imaging and audio recording technology. The result is a digital camcorder offering Canon's outstanding optical performance and picture quality.

The Canon XL1 has been designed for professional film makers who need portability, plus high-quality recordings good enough for broadcasting. Its many unique features will also appeal to professionals from other walks of life who desire to produce high-quality images.

The slimline housing of the XL1 is cast from a single piece of magnesium alloy. This is 20 times stronger than the resin used for conventional camcorder bodies, but very light. The casing makes the XL1 very rigid, durable, and easy to carry. The design allows comfortable carrying on the shoulder with the standard shoulder pad. A shoulder pad with 3-pin XLR connections for professional wireless microphones is optional. The XL1 allows different recordings to be made simultaneously on four separate audio channels - an industry first.

Even though the XL1 is equipped with many features, handling this camcorder is straightforward and comfortable, thanks to the well-designed layout of the controls. The operating switches are grouped by function and placed so that frequently used controls are the most accessible. The Start/Stop and Zoom controls are duplicated and positioned on the top and side grips so that they are always close at hand, whatever the shooting angle. The professional-style colour viewfinder can be adjusted accordingly.

Combine all this with advanced 3 CCD pixel shift technology for true-to-life recordings, and you have a flagship camcorder which leads the field in this exciting new age of digital video.





3 CCD Pixel Shift technology

3 CCD

The XL1's high-quality colour recordings come from its use of a 3 CCD system with Pixel Shift. Three separate one-third inch CCDs are each dedicated to a different primary colour red, green or blue. After passing through the lens, light is split into its primary components and sent to its own CCD.

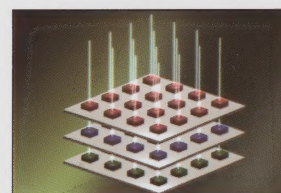
This gives natural colour reproduction together with low colour noise and low aliasing. Each CCD sensor offers 320,000 pixels, with each pixel about 150% larger than normal for this type of camcorder. The result is an improvement in sensitivity of about 4dB, allowing shooting in extremely low-light conditions.



Pixel Shift

Human eyes are most sensitive to green. The green component of a video signal contains about 60% of the picture detail. Canon has physically shifted the green CCD the distance of half a pixel horizontally in respect of the red and blue CCDs, and then electronically shifted the green signal vertically by the same distance.

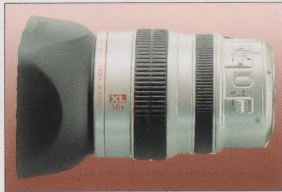
This increases the sampling points, giving a resolution which rivals that from 470,000 pixel systems. Picture quality is exceptional, with excellent low light performance and minimal vertical smear. The larger light capturing area of each pixel also gives a higher signal-to-noise ratio and greater dynamic range. In addition, amazingly clear still images can be obtained from videos of moving subjects.



High resolution interchangeable lenses

16x zoom lens XL 5.5-88mm

The XL1 comes with the most powerful interchangeable optical lens available on a digital camcorder so far: the XL 5.5-88mm high resolution 16x zoom (32x digital) with



built-in Optical Image Stabilization and 1.5 ND filter. The zoom range is equivalent to a focal length range of 39mm to 1248mm with a 35mm camera.

The DV standard consists of 500 TV lines; this Canon lens exceeds this standard by resolving over 600 TV lines, achieving outstanding image sharpness and contrast through its higher sensitivity. This is most noticeable in the all important 100 to 250 TV line resolution area.

Other lens options

The XL1 features a new lens mount for the new range of powerful XL lenses. Available in the near future is a 3.4-10.2mm 3x extra wide-angle zoom (giving an equivalent



focal length range from 24mm to 72mm in 35mm camera terms). More lenses will follow to extend the system and meet the individual needs of all users. To further boost the power of the XL lenses, the 1.6x XL Extender

can be attached. This Extender increases the magnification of any XL lens by 60% without loss of image sharpness. Another valuable accessory is the optional EF Adapter XL, which allows Canon's extensive range of over 50 EF lenses to be used with the XL1. This gives the camcorder an equivalent focal length range from 24mm to over 8600mm (with EF 1200mm lens) in 35mm camera terms. Focusing is manual with EF lenses.





AE shift

Allows the image brightness provided by the automatic exposure (AE) function to be lightened or darkened (13 settings from +2 to -2).

Zoom ring

By turning the zoom ring at different rates, the zoom speed can be varied so that moving from one end of the focal length range to the other takes anything from 2 to 16 seconds. A display in the viewfinder gives a reminder of the zoom position.

Focusing ring

Push AF-button

Besides the AF-MF switch, there is the Push AF button. If this is pressed while the lens is set to manual focusing, the lens will rapidly focus automatically. Temporary manual focus is also possible during autofocus, simply by turning and holding the lens focusing ring.

LCD panels

A comprehensive view of the camcorder settings is shown in the LCD panels.



ND filter

Power dial

Selects the required shooting program. Six program modes are available.

180,000 Pixel colour multi viewfinder

Adjustable to suit the user's line of sight with the left or right eye; includes built-in dioptre control. Switches to a Sports Finder when required. A "zebra" pattern of diagonal stripes appears in the viewfinder to highlight areas of overexposure (when brightness reaches 80 IRE or higher).

White balance control

There are four settings - Auto, Set, Pre-set 5600K and Pre-set 3200K.

Gain dB

When shooting in low light, the gain control can be adjusted to show the subject clearly while maintaining the atmosphere of the scene. There are four pre-set levels from -3 to +12dB, plus auto.

Manual iris

Provides +11 to -11 steps exposure over-ride in Exposure Lock and settings from f1.6 to f16 in 0.25 stop increments in Manual.

Manual shutter

The XL-1 can be set to shutter speeds from 1/50th to 1/16,000th sec.

Slow shutter

In addition to the manual shutter speeds, 3 digital slow shutter speeds can be selected.

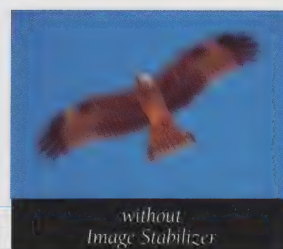
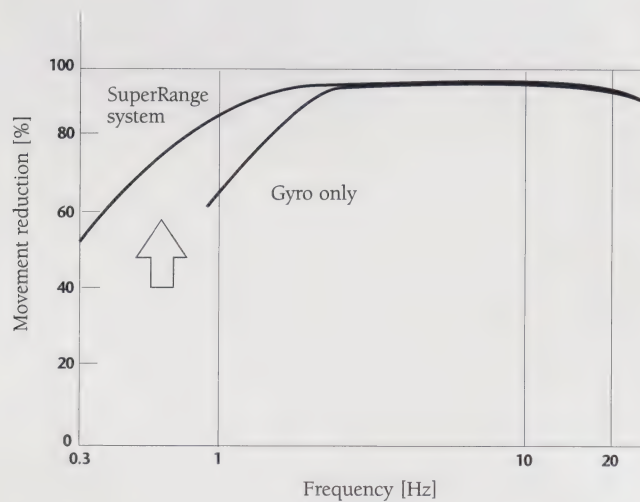




SuperRange Optical Image Stabilizer

The XL1 features an advanced Optical Image Stabilization system. The lens incorporates a Vari-Angle Prism formed from two glass plates separated by a high-refractive-index liquid. A gyro sensor in the camcorder detects vibration and feeds data to the prism, which reacts by changing shape. This bends the rays of light to keep the image reaching the CCDs steady.

The advanced SuperRange Optical Image Stabilization system in the XL1 examines the image once again after it is received by the CCD to detect any low frequency vibrations missed by the gyro. This data is then fed back to the prism, which refines its corrections to reduce the effect of camera shake even more. CCD detection greatly improves the performance with low frequency vibration, resulting in the most advanced optical image stabilization system currently available.



Four audio channels and three shooting modes

The XL1 can record sound in three different audio modes and capture images in three different shooting modes.

Four audio channels

Audio Mode one (16 bit) records two channels at 48kHz for the highest stereo sound quality. Mode two (12 bit Stereo 1) records two channels at 32kHz, leaving two channels for the later addition of music or narration.

Mode three (12 bit Stereo 1 plus Stereo 2) allows simultaneous recording on four separate channels, which can be output as four independent channels for post-recording sound editing. All the channels can be manually controlled and are fully adjustable. This unique feature makes the XL1 the most versatile digital camcorder available for audio recording.



Three shooting modes

Normal Movie mode is for conventional video shooting, when the results are to be viewed on a television screen.

Frame Movie mode captures high-resolution frame still images using Pixel Shift technology. It can continuously record an amazing 25 frame still images a second, effectively eliminating motion flicker by capturing a full image with every scan. This mode is perfect for movement analysis.

Photo mode, the camcorder records the image for about six seconds, during which time the audio system can be used to add a narrative. In low light, a Speedlite 380EX can be used on the XL1 (with the optional adaptor FA100). The Speedlite sends out a pre-flash to determine the flash duration required. Shutter speeds between 1/60 and 1/1000 second can be set, allowing fill-in flash in backlit situations.





Professional performance

The Canon XL1 offers professional performance in every aspect. The side and top grip and the double set of recording and zooming controls allow shooting from the shoulder or hip to suit each shooting situation. The 180,000 pixel colour viewfinder can be adjusted to suit the line of sight, and is compatible with the left or right eye. The viewfinder is transformed into a sports finder by a simple switch. All the camcorder controls are grouped by function and laid out to suit their frequency of use.

Digital interface IEEE 1394

In addition to the regular video and audio outputs, the XL1 features a DV-In and DV-Out interface, which allows direct connection to any IEEE 1394 compatible devices. It only requires a single cable for the simultaneous transmission of image, sound and camera control data. This cable connection allows "hot plugging"; there is no need to turn your computer off. All settings will be automatically adjusted, simply plug and play!

The XL1 is also fully compatible with the optional Canon DV Capture kit DK-1, for linking any DV camcorder to a PC.

Creative shooting accessories

In addition to the **1.6x Extender** and the **EF Lens Adapter**, there is a range of accessories available to extend the creative possibilities of the XL1: **MA-100 Microphone Adapter**: provides a shoulder support for the camcorder; includes XLR connections for professional audio/wireless microphones, **FS-72U Filter Set**: contains an ultraviolet, neutral density and circular polarizing filter, **FA-100 Flash Adapter**: allows the Speedlite 380EX to be used on the XL1 **Speedlite 380EX**: which can be used with the XL1 in Photo mode to give SLR-style flash photography, **VL-10Li Video Light**: 10 Watt lamp which can be attached to the camcorder. A range of lithium ion battery packs are available giving usage times up to 100 minutes. **CH-900 Dual Battery Charger/Holder**: charges two battery packs one after the other. The CH-900 containing charged batteries can be connected to the XL1 to give usage time up to 5 hours.

Wide range of accessories

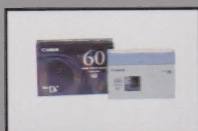
Many different accessories are available for the XL1, extending the versatility of this remarkable digital camcorder.

The following items are supplied as a kit with the XL1 body:

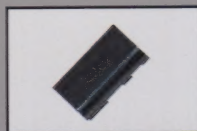


Zoom lens 16x XL 5.5-88mm IS
BP-927 Battery Pack
CA-900 Compact Power Adapter
DC-900 DC Coupler
SS-1000 Shoulder Strap
WL-D2000 Wireless Controller
SP-100 Shoulder Pad
S-150 Stereo Video Cable
STV-150 Stereo Video Cable
DVM-E30 DV Cassette
Lens Hood
Lens Soft Case
Microphone unit

The following items are optional accessories:



DV Cassette DVM-E60/E30
Digital video tape cassette offering 60/30 min of recording time



BP-911/ 914/ 924/927/ 941
Battery Packs



CB-900
Car Battery Adapter



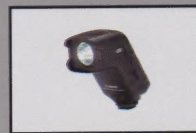
CH-900 Dual Battery Charger/ Holder
DC-910 DC Coupler



Extender XL 1.6X
Increases the focal length of an XL lens by 1.6x



FS-72U
Filter Set



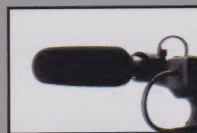
VL-10Li
Video Light



SA-1
Adapter Bracket
Attaches a video light securely to the XL1



MM-200
Stereo Mixing Microphone
Mixes live sound and music



ZM-100 Stereo Zoom Microphone: provides switchable stereo and zoom modes for extra recording control



MA-100
XLR Microphone Adapter/ Shoulder Pad



HC-3000 case
A lockable system case offering protection during transport and storage



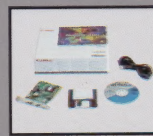
EF Adapter XL
Allows Canon EF lenses to be attached; the effective focal length becomes 7.2x that of the EF lens



Speedlite 380EX



FA-100 Flash Adapter
Allows the Speedlite 380EX to be used on the XL1



DV Capture Kit DK-1
Links a DV camcorder to a PC for still image capture



RGB-100E
RGB Converter
enables high-quality images to be viewed on monitors without an S-video connection

Specifications

General

Power Supply Voltage	7.2 VDC
Power Consumption	approx. 9.5 W (recording, with AF focus)
Operating Temperature	0° C to 40° C, 85% relative humidity
Dimensions (WxHxD)	approx. 223 x 214 x 415
Weight (camera only)	approx. 1700 g
Weight (fully equipped)	approx. 2860 g
Continuous Recording Time	approx. 90 min. with BP-927 battery pack
Chassis	Magnesium Alloy Casing

Camera Section

Camera	
Imaging Device	3x 1/3-inch CCD (3 CCD Pixel Shift)
Pixel Count (per CCD)	Total 320,000 pixels. Effective 300,000 pixels.
Colour Separation	Prism and dichroic filter
Digital Quantization	8-bits A/D
Signal Composition	PAL standard colour video signal
Scan Method	625 lines, 50 fields / 25 frames
Auto Exposure Modes	5 Modes: Easy recording, Automatic, Shutter Priority, Aperture Priority, Spotlight plus Manual
Shooting Modes	Field Movie Mode Frame Movie Mode Photo Mode
Light Metering Method	Lower center-weighted average metering
Evaluation	56-zone evaluation metering: Spotlight mode
Minimum illumination	approx. 2 lux (with XL 5.5-88mm IS lens, and slow shutter at 1/6th of a second)
Shutter Speed (Tv mode)	1/50 to 1/16,000 second
Slow Shutter	1/6, 1/12, 1/25 second
Aperture (Av mode)	f1.6 to f16 (depending on lens used)
Gain	-3/A/0/+6/+12dB
AE Level Shifting	+2.0, +1.5, +1.0, +0.75, +0.5, +0.25, ±0, -0.25, -0.5, -0.75, -1.0, -1.5, -2.0
White Balance	Automatic, Manual, 5,500 K, 3,200 K
Flash	Speedlite 380EX (with optional FA-100 flash adapter)
Lens Mount Method	Bayonet mount (XL mount system) EF Lens (w. optional adapter), Focal length increases 7.2x for EF-Lens

Lens

Lens Mount Method	Bayonet mount (XL mount system)
Zooming Speed	XL 5.5-88mm IS: 14 speed zooming (variable speeds) using electronic zooming ring and lever

AF (Autofocus)

Method	TTL Image Signal Detection
AF Operating Range	Close-up to Infinity (depending on lens used) (XL 5.5-88mm IS: 2cm to infinity)
Manual Focus	Electronic Focus Ring
Focus Override	Temporary Focus Override without turning the AF off
Push AF	Focus Button
Built-in Filter	XL 5.5-88mm IS: ND-Filter On - Off
Image Stabilization	XL 5.5-88mm IS: Super Range Optical Image Stabilizer
Filter Diameter	72mm

Viewfinder

Type	Electronic Viewfinder / angle adjustable
Image Display	0.7-inch colour LCD, approx. 180,000 pixels
Eyepoint	2 positions: 23mm (at eye), approx. 68mm (with sports viewfinder)
Diopter Adjustment	+2.0 to -5.0 diopter (at eye)

General

Format	MiniDV
Recording Method	Consumer digital DVC (SD specifications) PAL format (625 lines, 50 fields) Approx. 18.83 mm/sec SP mode Approx. 12.57 mm/sec LP mode
Tape Speed	1/4-inch Mini DV 66.0 x 48.0 x 12.2 mm approx. 90 min. with BP-927 battery pack Approx. 2 min. 50 seconds using 60 min tape
Tape	
Cassette Size	
Recording Time	
FF / REW Time:	

Audio

Sampling Frequency	48kHz / 16 bit : 2 ch 32kHz / 12 bit : 4 ch; for recording: stereo 1/ stereo 1, stereo 2; for playback: stereo 1/ stereo 2/ stereo 1-2 mix (variable mix ratio)
Maximum Sensitivity	-71 dBv
Signal Level	-59 dBv
Microphone	Stereo Microphone included

Signal Input

DV In Signal	IEEE1394-AV/C protocol compatible
Audio In	Audio 1 RCA pin jacks Audio 2 RCA pin jacks

Signal Output

DV Out Signal	IEEE1394-AV/C protocol compatible
Video Out	Signal level 1 Vp-p 75Ω (Composite)
S-Video Out	C: 0.3 Vp-p Y: 1.0 Vp-p RCA 4dBm (full scale)

Audio Out

Others

DV Input / Output Terminal	Special 4-pin (IEEE 1394 compatible)
Audio Input Terminals	RCA pin jack L / R (AUDIO 1) RCA pin jack L / R (AUDIO 2) 4-pin mini-DIN RCA pin jack RCA pin jack L / R (AUDIO 1) 3.5-mm stereo mini-jack 3.5-mm stereo mini-jack 2.5-mm mini-mini-jack Special 6-pin LANC compatible
S-Video Signal Terminal	
Video Output Terminals	
Audio Output Terminals	
External Mic Terminal	
Headphone Jack	
Mic Power Terminal	
Flash Terminal	
Edit Terminal	

Accessories

Wireless Controller	WL-D2000
Grip	Shoulder Pad SP-100
Power Supply	Dual Battery Charger Holder CH-900 (optional)
Mic Adapter / Shoulder Pad	Combined Microphone (using XLR 3 pin) and Shoulder Pad (optional)

* Weight and dimensions shown are approximate. Specifications are subject to change without notice.

Canon

Canon Inc.
30-2, Shimomaruko 3-Chome,
Ohta-Ku, Tokyo 146-8501, Japan

Canon Europa N.V.
P.O. Box 2262,
1180 EG Amstelveen,
the Netherlands
<http://www.europe.canon.com>

Canon (U.K.) Limited
Consumer Group, Brent Trading
Centre, North Circular Road,
Neasden, London NW10 0JF
Telephone No: 0181-459 1266
Facsimile No: 0181-459 4202
<http://www.canon.co.uk>

Canon Hongkong Co., Ltd.
10th floor, Mirror Tower,
61 Mody Road, Tsimshatsui East,
Kowloon, Hong Kong
Telephone No: 852-2739 0802
Facsimile No: 852-2369 7701

Canon Singapore Pte. Ltd.
79 Anson Road # 09-01/06,
Singapore 079906
Telephone No: (65) 532 4400
Facsimile No: (65) 221 2939
<http://www.com.sg>

Canon Australia Pty. Ltd.
1, Thomas Holt Drive,
North Ryde,
N.S.W. 2113, Australia
Free-call: 1800 816 001
Facsimile No: (02) 9887-4484

Canon New Zealand Ltd.
Fred Thomas Drive, Takapuna,
Auckland, New Zealand
Telephone No: (09) 489-0300
Facsimile No: (09) 489-0380
<http://www.canon.co.nz>

VIDEO ACCESSORIES PTY. LTD.

A.C.N. 007 170 194

1 CLARENCE STREET
BENTLEIGH EAST, VIC. 3165

TELEPHONE: (03) 9579 5933
FAX: (03) 9570 7471